APPLICATION NO.   09/826,118

TITLE OF INVENTION: Wavelet Multi-Resolution Waveforms

INVENTOR: Urbain A. von der Embse

Clean version of how the ABSTRACT OF THE DISCLOSURE will read.

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5   ABSTRACT OF THE DISCLOSURE

A method for designing Wavelets for communications and radar which combines requirements for Wavelets and finite impulse response FIR filters including no excess bandwidth, linear
10 performance metrics for passband, stopband, quadrature mirror filter QMF properties, intersymbol interference, and adjacent channel interference, polystatic filter design requirements, and non-linear metrics for bandwidth efficient modulation BEM and synthetic aperture radar SAR.   Demonstrated linear design
15 methodology finds the best design coordinates to minimize the weighted sum of the contributing LS error metrics for the respective performance requirements. Design coordinates are mapped into the optimum FIR symbol time response. Harmonic design coordinates provide multi-resolution properties and enable
20 a single design to generate Wavelets for arbitrary parameters which include dilation, down-sampling, up-sampling, time translation, frequency translation, sample rate, symbol rate, symbol length, and set of design harmonics. Non-linear applications introduce additional constraints. Performance
25 examples are linear communications, BEM, and SAR.

1